

CLAIMS

What is claimed:

1. A lateral double-diffused MOSFET semiconductor device comprising:
 - a substrate;
 - an epitaxial layer formed on the substrate;
 - a well region formed in the epitaxial layer;
 - a source region formed in the well region;
 - a drain region formed in the epitaxial layer;
 - a gate region located above at least a portion of the well region; and
 - a split-drift region located between the source region and drain region.
2. The device of Claim 1, wherein the split-drift region comprises a super junction portion and a reduced surface field portion.
3. The device of Claim 2, wherein the super junction portion is positioned adjacent to the well region.
4. The device of Claim 2, wherein the super junction portion comprises alternately arranged pillars of first and second conductivity types.
5. The device of Claim 2, wherein the reduced surface field portion is located adjacent to the drain region.
6. The device of Claim 5, wherein the reduced surface field portion comprises a first conductivity type and the substrate comprises a second conductivity type.

7. The device of Claim 2, wherein the length of the reduced surface field portion is much less than the length of the super junction portion.

8. The device of Claim 7, wherein the product of the doping concentration of the reduced surface field portion and the vertical thickness of the reduced surface field portion is about 2×10^{12} .

9. The device of claim 4, wherein the product of the doping concentration of the super junction pillars and a transverse pillar width is about 2×10^{12} .

10. The device of claim 1, further comprising an oxide layer formed over the split-drift region and metal field plates formed on portions of the oxide layer adjacent to the gate region and the drain region.